U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE

OCT 26 2004

MEMORANDUM FOR: Distribution

FROM: W/OPS2 - /s/ Douglas F. Hess

SUBJECT: AWIPS Linux Data Server Replacement, Serial MUX Replacement, Gigabyte LAN Upgrade Operational Acceptance Test Plan, October 2004

The attached plan describes how the National Weather Service (NWS) will conduct an Operational Acceptance Test (OAT) of the Advanced Weather Interactive Processing System (AWIPS) Data Server Replacement (DX/NAS), Serial MUX replacement, Gigabyte LAN (gig-e) Upgrade. The DX/NAS will add a new rack at all AWIPS sites containing the replacement for the old data servers. The data servers will not be replaced during this OAT. They will be removed at the end of the software upgrades which will move all the processes currently running on the DS onto the new DX/NAS system. This OAT will move all the AWIPS data to the new DX/NAS but leave all processes on the old servers. The gig-e LAN upgrade will be added to the current configuration and the new Linux servers and workstations will be moved to the faster gig-e switch. The serial MUX replacement will be installed but not activated. Later software upgrades will activate the new serial MUX.

The plan describes the equipment, OAT sites, personnel and resource requirements, methodology, schedule, and reporting for this OAT. The DX/NAS, gig-e, and serial MUX replacement are part of the ongoing tasks to improve AWIPS performance and security and to address AWIPS life cycle support.

There are twelve participating sites during a 90 day period, from late October 2004 to February 2005. The OAT sites include one regional headquarters system, nine Weather Forecast Offices (WFO) with at least one in each of the six NWS regions, one River Forecast Center (RFC) and one National Center for Environmental Predication (NCEP). These sites will allow testing at each of the operational site types.

Mary Buckingham, W/OPS24, is the OAT director. Questions or comments should be directed to Mary by e-mail at Mary.Buckingham@noaa.gov, facsimile 301-713-0912, or telephone 301-713-0326 x137.

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AWIPS

Linux Data Server Replacement, Serial MUX Replacement, Gigabyte LAN Upgrade

Operational Acceptance Test Plan

October 2004

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service/Office of Operational Systems
Field Systems Operations Center/Test and Evaluation Branch

Executive Summary

This plan defines the method the National Weather Service (NWS) will use to conduct an Operational Acceptance Test (OAT) of the Advanced Weather Interactive Processing System (AWIPS) Linux Data Server Replacement, Serial MUX replacement, and Gigabyte LAN upgrade. The Linux Data Server Replacements are new servers with a Network Attached Storage (NAS) in a new rack added to AWIPS. The initial step in the Data Server Replacements consists in adding the new hardware to the system and moving all the data to the new NAS. The Serial MUX replacement will only add a new Serial MUX without any changes to the serial connections in AWIPS until a later software load. By moving the data to the new NAS, it is hoped the AWIPS will see an improvement in throughput from the faster NAS. This upgrade is part of the ongoing upgrade of AWIPS to Linux based systems. The overall Linux migration project for AWIPS is intended to improve AWIPS performance during severe weather and to address AWIPS life cycle support. The plan describes the equipment, OAT sites, personnel and resource requirements, methodology, schedule, and reporting.

The purpose for this OAT is to verify the new equipment's installation process, operational performance, maintenance impact, and reliability is ready for deployment to all NWS AWIPS sites. The OAT will provide NWS management with data on the performance of the new equipment in routine operational use at 12 offices including nine Weather Forecast Offices (WFO), one River Forecast Center (RFC), one National Center for Environmental Prediction (NCEP), and one Regional Headquarters during a 90-day period, from late October 2004 through January 2005. The OAT site personnel will install and configure the new equipment.

The new equipment will be used in normal operations for the duration of the OAT. Operators or technicians will note problems in logs and contact the AWIPS Network Control Facility (NCF) for problem resolution. The AWIPS Linux Data Server Replacement hardware will be covered by vender-supplied maintenance with the vendor and a small quantity of spares at the National Logistics Support Center (NLSC). During the OAT, conference calls between the OAT managers and the field sites will provide information on the installation and any problems with the AWIPS Linux Data Server Replacements.

The NWS Office of Science and Technology (OST) Systems Engineering Center (SEC) manages the program for all of the Linux migration projects. The NWS Office of Operational Systems (OOS) Maintenance Branch will draft the AWIPS System Modification Note and the Test and Evaluation Branch (TEB) will coordinate the AWIPS Linux Data Server Replacement OAT and document the OAT results in a test report provided to NWS management.

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ATTACHMENTS

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Acronyms

AWIPS	Advanced Weather Interactive Processing System
CLS	Consolidated Logistics System
CP	Communication Processor
DS	Data Servers
DX/NAS	Linux Data Server Replacement
EHB-4	Engineering Handbook No. 4
EMRS	Engineering Management Reporting System
FMK	Field Modification Kits
FSOC	Field Systems Operations Center
Ghz	gigahertz
gig-e	Gigabyte LAN switch
HIC	Hydrologist-in-Charge
HP	Hewlett-Packard
HP-UX	Hewlett Packard Unix
HSL	high speed LAN
LAN	local area network
LX	Linux workstations
Mbps	megabits per second
MIC	Meteorologist-in-Charge
NAS	Network Attached Storage
NCEP	National Center for Environmental Prediction
NCF	Network Control Facility
NGIT	Northrop Grumman Information Technology, Inc.
NLSC	National Logistics Support Center
NRC	National Reconditioning Center
NWS	National Weather Service
OAT	Operational Acceptance Test
OCONUS	Outside the Continental United States
OOS	Office of Operational Systems
OST	Office of Science and Technology
PC	Personal Computer
PERC	PowerEdge Expandable RAID Controller
PX	pre-processor

RFC	River Forecast Centers
SCSI	Small Computer System Interface
SDRAM	Synchronous Dynamic Random Access Memory
SEC	Systems Engineering Center
SID	site identification
SRH	Southern Region Headquarters
SST	Site Support Team
TRG	Test Review Group
WFO	Weather Forecast Offices
WSH	NWS Headquarters
XT	X-Terminals

PART I: OAT Overview

1.0 Introduction

This plan describes the method the National Weather Service (NWS) will use to conduct an Operational Acceptance Test (OAT) of the Advanced Weather Interactive Processing System (AWIPS) Linux Data Server Replacement (DX/NAS), Serial MUX replacement, and Gigabyte LAN switch (gig-e) upgrade. The plan presents the OAT objectives, methodology, management, material resources, and schedule. The roles and responsibilities of NWS personnel in selecting OAT sites, configuring them, and operating the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements are also identified. The OAT will validate the operational use of the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements at nine Weather Forecast Offices (WFOs), one River Forecast Centers (RFC), one National Center for Environmental Prediction (NCEP), and one Regional Headquarters system (see Part II, Section 2.0, OAT Sites).

Operational data volumes have increased in AWIPS and performance problems and throughput ceilings were identified as important limiting factors. To address these problems, the NWS is implementing open source Linux technology and high performance Personal Computer (PC) hardware. As the third step of the first phase of the migration of AWIPS hardware to Linux PC-based equipment (see Section 4), the AWIPS DX/NAS, gig-e switch, and serial MUX replacement software on a Linux PC platform is intended to help solve the performance problems by adding the Linux DX/NAS, gig-e switch, and serial MUX replacements to offload decoder processing from the overloaded Data Servers (DS) to improve overall data flow performance in the AWIPS system. The Linux DX/NAS, gig-e switch, and serial MUX replacements are new servers with a Network Attached Storage (NAS) in a new rack added to AWIPS and dubbed DX/NAS.

Because of the complexity of replacing the DS, the activity will be conducted in several steps requiring both hardware and software changes to the system. The initial step in the DX/NAS, gig-e switch, and serial MUX replacements consists in adding the new hardware to the system and moving all the data to the new NAS. By moving the data to the new NAS, it is hoped the AWIPS will see an improvement in throughput from the faster NAS.

This upgrade is part of the ongoing upgrade of AWIPS to Linux based systems. The overall Linux migration project for AWIPS is intended to improve AWIPS performance during severe weather and to address AWIPS life cycle support. This OAT will evaluate the first step of the DS replacement of Phase II of the *AWIPS Linux Migration Plan* and ensure the system is ready for national deployment.

In addition to the DX/NAS rack installation, a new Ethernet 1000/100/10 Mbps LAN switch (gig-e switch) will be added to the system and the Serial MUX replacement will only install a new Serial MUX without any changes to the serial connections in AWIPS until a later software load . They are added to the DX/NAS upgrade for convenience since the hardware is available at the same time.

The second step of the DS replacement will occur shortly after the DX/NAS installation. It will consist of a software load (OB4.AS) which will move some processes to the new DX and thereby

improve the system performance. The OB5 release will occur shortly afterwards and will enable the removal of the AS from the AWIPS. At that time, the ASs will be decommissioned and removed from the system and the serial MUX replacement will be activated. The AS1 rack will no longer be needed and it will be removed with the new DX/NAS rack moved into its place.

2.0 Purpose

The OAT for the AWIPS DX/NAS , gig-e switch and serial MUX replacement will provide NWS management with information about the installation process and the operational and maintenance impact, performance, and reliability of the new hardware and software at a representative sample of NWS offices over a 90-day period. The OAT will aid in improving the installation process to reduce the adverse impact on field operations during deployment.

3.0 OAT Objectives

The AWIPS Linux DX/NAS , gig-e switch, and serial MUX replacement OAT objectives are:

a. Verify the Linux DX/NAS , gig-e switch and serial MUX replacement AWIPS System Modification Note(s) allow site personnel to install the new AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement, connect it to AWIPS, and reconfigure the system with a minimum of disruption to the site data flow and operations.

b. Verify the AWIPS Linux DX/NAS , gig-e switch and serial MUX replacement and reconfigured system operates reliably during site operations in a 90-day demonstration at 12 sites.

c. Verify the AWIPS Linux DX/NAS and gig-e switch replacement product and data retrieval are at least as fast and reliable as the existing Hewlett-Packard (HP) DS.

d. Verify the AWIPS Linux DX/NAS and gig-e switch replacement , reconfigured DX/NAS, DS and AS can be switched to their backup configurations and support the site's needs.

e. Verify the Network Control Facility (NCF) can monitor the AWIPS Linux DX/NAS , gig-e switch and serial MUX replacement .

f. Verify the site service backup can operate correctly with a non-DX AWIPS site and vice versa.

4.0 Background

The existing original AWIPS hardware is now over eight years old. As operational data volumes have increased, performance problems and throughput ceilings have been identified as important limiting factors. To address these problems, the NWS is migrating AWIPS to the use of open source Linux technology and high performance PC hardware. The first phase in the AWIPS Linux PC migration is complete and consisted of Linux workstation augmentation during 2001, the hosting of the AWIPS Communication Processor (CP) software on a Linux PC platform and

the addition of the high speed LAN (HSL) to replace the 10 megabits per second (Mbps) local area network (LAN) segment in the site architecture, the insertion of a pair of data pre-processor (PX) servers to handle the product decoding function performed on the DS and AS completed in 2003, and the full replacement of the HP workstations with Linux workstations (LX) completed in 2003 and replacement of the X-Terminals (XT) with lower end PCs in 2004. The deployment of the XTs will overlap the testing of the new DX/NAS , gig-e switch, and serial MUX replacement.

The goals for the DX/NAS ,and gig-e switch, serial MUX replacement upgrade include:

Hardware
- Utilize Network Attached Storage (NAS) technology
- Deploy commodity servers on GbE LAN
- Incrementally deployed and activated
- Promote reuse of select hardware
- Remove limitations of direct attached storage

Software
- For availability, move from COTS solution to use of public domain utilities
- Some experience with NCF and REP
- Can be decoupled from operating system upgrades
- Supports NAS environments
- Can be augmented for load balancing if required
- Deploy low cost Linux database engine

The overall methodology to move to the new architecture is:
- Stage hardware, move software when ready
- Reuse hardware to ease transition and allow planned decommissioning
- Deploy flexible availability framework
-

The goals for the new architecture are:
- Decommission AS, AdvancedServer, DS and FDDI
- Support universal deployment of single Linux distribution (currently RHE3.0 with OB6)
- Provide dedicated resource for local applications
- Expandable within framework (easy to add servers allows expansion to multiple nodes)
- Deploy to subset of sites prior to February 2005 to address poor performance during severe weather season in 2004.

Step 1 of the DS Replacement project:
- Install the new DX server pair, NAS, gig-e switch, and serial MUX replacement:
- Release OB4 is a prerequisite
- Initial staging of hardware
- New rack
- NAS w/LTO-2 tape (~400GB storage and backup)
- 2 commodity servers – DX1/DX2
- 2 GbE switches and associated cables, etc
- 2 8-port serial mux replacements (installed in PX1/2)
- NAS key to incremental deployment and activation

- Serial mux replacements installed but not activated
- LTO-2 drive for site backup
- New hardware and PX1/PX2 on GbE LAN
- LDAD firewall upgrade deployed independently
- Deployed in two phases. Second phase deployed in March - April 2005

Step 2 of the DS Replacement project:

- Decommission AS1/AS2 (planned for January or February 2005 for first set of DX sites; concurrent with step 1 for phase 2 DX sites)
- Release OB4 maintenance release (OB4.AS) of stable OB5 software required for AS decommissioning
- Activate DX1/DX2
  - Infrastructure/decoders move to DX1
  - IFP/GFE to DX2
  - Newly ported functionality to DX1
- Reuse PX1 and PX2 as PX1 and SX1
  - PX1 for applications/processes using processed data
  - SX1 for Web Server, local applications and eventually LDAD
  - Activate serial MUX replacement and ported APS
  - Non-ported software from AS1 to DS2
- DX1/DX2 deployed with RH Enterprise 3 necessary due to lack of drivers for current AWIPS Red Hat version

Incremental Activation

- Failover scheme
  - DX1 to DX2
  - DX2 to DX1
  - PX1 applications and servers to DX2
  - PX1 processes APS and NWWSProduct to SX1 (require PCI-X card access)
  - SX1 baseline software to PX1
- Decommission AS1/AS2 and excess rack
- Linux SMTP MTA deployed as start of migration from x.400 (required for DS decommission)

- Provide sites with some level of performance improvement as early as software readiness allows

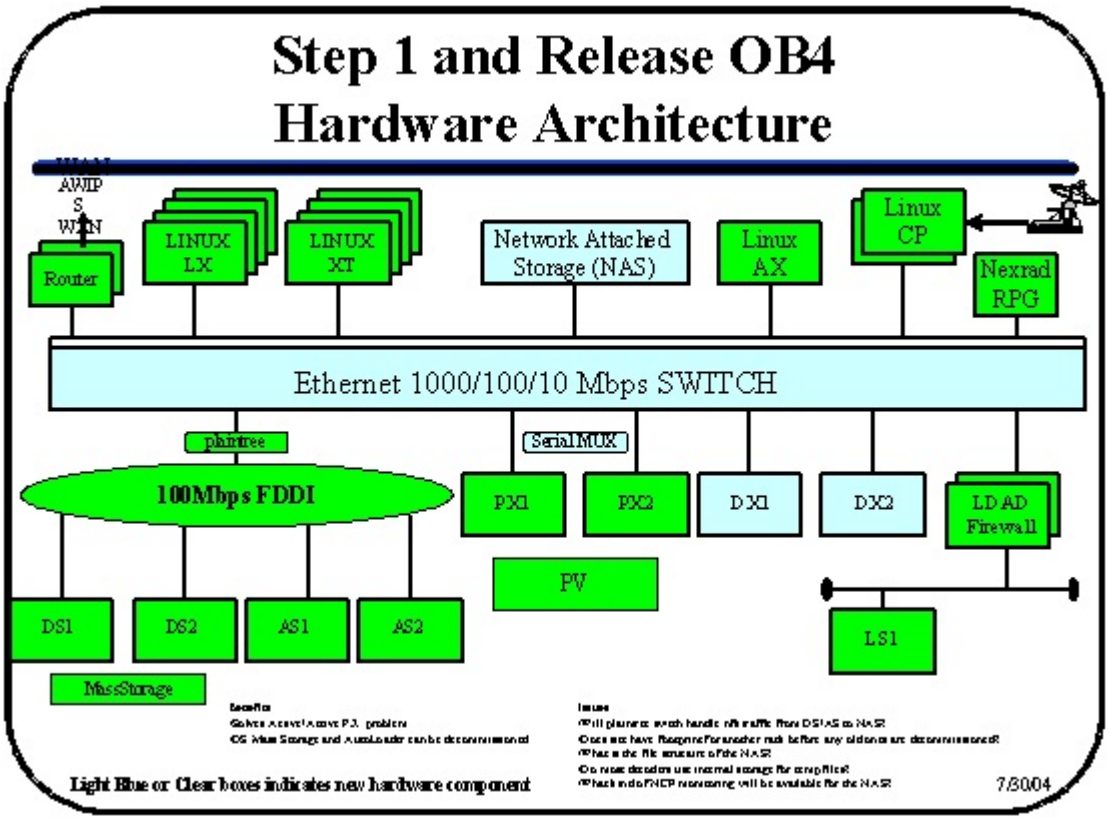

Figure 3. Step 1 and OB4 Architecture

Step 3 of the DS Replacement project:

Deploy Data Base and OS (OB6)

- Deploy Linux PostgreSQL data base engine to DX1
  - Move existing PV to new rack and connect to DX1/2
  - Reconfigure PV (possibly into 2 separate direct attached disk farms, one for each DX)
  - Database availability via mirrored or replicated databases is TBD at this time
  - May be accelerated to OB5 for fxatext database
- Migrate ported databases
- Upgrade operating system (currently RHE3.0) on all applicable hosts
  - LX/XT
  - CP (if full DVB deployment complete)
  - DX
  - AX
  - PX/SX
  - RP (RFCs only)

Incremental Activation

- Decommission AS 2.1 and HP Informix
- HP Informix engine can remain on DS for site local application use
- Transition to SMTP and decommission x.400
- Consideration - Can/should PostgreSQL be delivered early to RH7.2 DXs?
  Most sites run software against GFS databases, not their own databases.
  Database and software will be tested with RHE3 only as part of OB6.
  If databases delivered early how/when does parallel ingest get developed and tested?
  Should RFCs be handled differently?

Step 4 of the DS Replacement project:

- Deploy LDAD Upgrade
  Deploy LS1 and LS2
  Deploy redundant server pair (requirements still tbd)
- Could reuse PX1/SX1 as LS1/LS2 and use new generation hardware for PX1/SX1
- Activate LS1/LS2
  Migrate internal LDAD processing to SX1
  Some internal and external LDAD processing must transition at same time
- Reuse existing HP LS on internal LAN
  Existing 10/100 MB LAN card

Step 5 of the DS Replacement project:

- Decommission DS1/DS2
- Continue to move ported software/databases to Linux servers
  Combine with step 6 if additional DXs are required
  DX1 for database server and infrastructure
  DX2 for IFP/GFE
  DXn for decoders
- All Linux devices on GbE LAN
- Remaining functionality on LS on 100MB LAN
  DialRadar/wfoAPI (tied to FAA/DoD requirements) may be OBE at this point. If so, Simpacts and LS can be decommissioned at all non-hub sites.
  Netmetrix (required at hub sites only)

Step 6 of the DS Replacement project:

- Incrementally add DX hosts for load balancing for new functionality and data sets.
  DX1 for database server and infrastructure
  DX2 for IFP/GFE
  DXn for decoders

4.1 Linux DX/NAS, gig-e switch, and serial MUX replacement Description and Configuration

The DX/NAS, gig-e switch, and serial MUX replacements are Dell rack-mounted servers sharing disks in a RAID configuration, 5-port LAN switches, and heartbeat LANs to connect the new

pieces and the existing Xyplex. The DX/NAS, gig-e switch, and serial MUX replacement components are:

***Hardware**:*

New rack (24 x 38 x 78 inches):

- Two (2) Dell Poweredge model 2850 servers running Linux RH Enterprise 3. The AS/DS Replacement Servers are referred to as Data LinuX (DX) servers.
  Technical Specifications:
  Dual 3.x Ghz Xeon, with 4 GB RAM and two 73 GB, 15k rpm SCSI HD (versus HP DS servers w/dual 160 Mhz CPUs and 512-768 MB RAM)
  2 PowerEdge 1650 PCs - Dual Pentium III CPUs clocked at 1.13 gigahertz (Ghz), 256K cache,
  1 GB Synchronous Dynamic Random Access Memory (SDRAM),
  36GB 10K rpm Ultra Small Computer System Interface (SCSI) internal hard drive,
  PowerEdge Expandable RAID Controller (PERC3)-CD RAID Controller
- Network Attached Storage (NAS) w/LTO-2 tape (~400 GB storage and backup)
- GbE switches and associated cables for connecting to the AWIPS GbE LAN

Separate equipment:

- Two (2) 8-Port Serial mux replacements
- Associated cables, FC Bridge, 5-port switches, documentation, media, etc.

***Software*:**

- The DX/NAS, RedHat Enterprise 3 (RHE3) while the rest of the Linux servers remain on Red Hat 7.2.
- The DX servers and files are accessed by the notation DX.
- The installed system will run with the databases on the NAS and all servers repointed to the NAS.

Refer to Attachment 1 for a description of the software files and architecture.

***Installation Kit**:*

The Northrop Grumman Information Technology, Inc. (NGIT) will install the disk configuration containing Red Hat Enterprise 3, device drivers, and AWIPS specific user accounts and disk partitions onto the new DX servers. The DX, NAS, and gig-e switch will arrive installed into a new rack delivered by truck. The DX/NAS and gig-e switch and will be ready to run once the installation scripts and localization are run. The installation scripts will change the MCServiceGuard software on the DS and AS to accommodate moving the databases to the NAS from the DS and the PowerVault. Cables, the new gig-e switch, and the serial MUX replacement will arrive in separate boxes. The serial MUX will not be activated at this time.

***Service**:*

The DX/NAS, gig-e switch, and serial MUX replacement hardware will be covered by a service agreement with the vendor, providing 4-hour response 5 days/week, 10 hours/day parts and labor, and on-site hardware maintenance for 3 years supplemented by spares

stocked by the National Logistics Support Center (NLSC). The OCONUS sites will have NLSC support with shipment by Federal Express. Shipments to Anchorage and Hawaii arrive the next day. Shipments to Guam arrive by noon on the 2nd day.

5.0 OAT Policies

The following conditions will be adhered to in the oversight of the OAT.

5.1 OAT Assumptions and Limitations

a. The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement must successfully complete the installation and stability test with no outstanding critical problems.

b. The NGIT will integrate the DX/NAS, gig-e switch, and serial MUX replacement and will be responsible for the OS configuration and disk partitions. The DX/NAS and gig-e switch Field Modification Kits (FMKs) will be shipped with the new rack in three boxes. An additional box containing the and serial MUX replacement FMK will be shipped separately from NGIT.

c. The AWIPS System Modification Note 24 (installation and configuration instructions) updates will be sent by e-mail to the sites as needed and made available on an Internet page.

d. The OAT site personnel will install the system, load the AS and DS software changes from a CD, configure, and localize the two new DX/NAS, gig-e switch, and serial MUX replacements. The site will decide where to place the DX/NAS rack, ensure adequate power supplies are available, and a standard AWIPS access hole is installed beneath the position for the new rack prior to it arriving on site in Mid October to early November.

e. The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement hardware is covered by a 3-year maintenance agreement with Dell Computer Corporation. A few spares will be maintained by the NLSC. After first contacting the NCF, in many cases, site personnel will get a spare from NLSC and the NLSC will work directly with Dell to troubleshoot and repair the hardware. NGIT will maintain the spares for the OAT.

f. The NWS NCF will provide 24-hour a day, 7 days a week support for the AWIPS Linux DX/NAS adn gig-e switch and will track problems with trouble tickets.

g. The OAT sites will have AWIPS release OB4 and the available maintenance patches installed prior to installing the Linux DX/NAS, gig-e switch, and serial MUX replacement.

H. The reconfigured DX/NAS system will be able to fully support service backup with non DX/NAS sites.

5.2 OAT Commencement and Prerequisites

The OAT will begin after the OAT director (see Section 6.0) verifies the following prerequisites are met:

a. OAT Plan is completed and signed by the Office of Operational Systems (OOS), Director, Field Systems Operations Center (FSOC) in coordination with the OOS Maintenance, Logistics and Acquisition Division, the Office of Science and Technology (OST) AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement Project Manager, and the AWIPS Regional focal points.

b. The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement equipment must be successfully installed and configured on a NWS Headquarters (WSH) test system and it must be operated for at least 72 hours with no critical problems unresolved.

c. The following must be received at each site:
   1. Rack containing the DX servers, NAS and gig-e installed (sent by RSTI trucking company).
   2. 3 Boxes delivered with rack from the NGIT (containing FC Bridge, LTO Tape Drive, Box of loose pieces [cables, 5-port switches, documentation, media, etc.]).
   3. 4th box shipped separately with the serial MUX replacement FMK.
   4. Latest version of the AWIPS System Modification Note 24 (mod note) (installation and configuration instructions.

d. The OAT sites must not install any of the hardware or software until the WSH OAT director has informed the site it may begin.

5.3 Site Installation

At all OAT sites, the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement equipment installations are performed by the NWS site personnel using the AWIPS System Modification Note. The OAT site personnel will install the AWIPS Linux DX/NAS rack, gig-e switch, and serial MUX replacements, and cables, configure the systems, and make the required connections. The operations of the site are not affected until the software activation script is installed. The hardware installation should take about five to six hours and an additional hour is needed to install the software. Until the software is activated, the installation can be halted and continued later with no adverse effect on the site operations. The databases will be moved to the NAS from the DS and PowerVaults after the installation is complete. The PowerVault will then have no AWIPS function and all servers will be repointed to the NAS.

Each site should carefully verify the data acquisition, decoders, and all applications to ensure all are operating correctly following the software installation. **Sites might have to manually**

mount local applications and local non-baseline systems connected to AWIPS. Installation assistance, if required, will be provided by telephone from the NCF at 301-713-9344**.**

5.4 OAT Conduct and Duration

The OAT will follow the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement OAT Plan, Part II, Section 3.0, OAT Methodology and Section 5.0, OAT Schedule. PAMS will be used to monitor and evaluate the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement during the installation and in normal operations during a 90-day period.

The OAT site National Center Director, WFO Meteorologists-in-Charge (MICs), and RFC Hydrologists-in-Charge (HICs) have the authority to suspend the OAT at their site if, at any time, the site service operations are negatively affected. They will notify the OAT director of this decision and why it was made as soon as practical.

OAT site personnel will log AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement problems and notify the NCF as soon as possible. They will also notify the OAT director of problems by email as soon as practical. Any problem deemed critical during the OAT will be a reason to suspend the OAT. After the installation, the sites should see no degradation in the performance of their system. It is hoped that sites will see an improvement in performance due to the faster NAS and gig-e switch. However, significant improvement is expected when software changes move certain processes to the DX in the OB4.AS and OB5 software releases. See the background section for more information on the plans.

5.4.1 Deficiency Classification

Validated deficiencies will be categorized as follows:

a. **Critical Deficiency** - A repeatable problem severely impacts site operations; no acceptable workaround exists.

   ACTION: The TRG recommends suspension of the test to the Project Manager. If suspended, the test resumes when the Project Manager approves a proposed corrective action. When an approved corrective action is implemented, regression testing may be required.

b. **Urgent Deficiency** - A repeatable problem severely impacts site operations; however, an acceptable workaround exists.

   ACTION: The test continues with the current system using a workaround until a permanent fix is available. Once the Project Manager approves the fix, only those test areas affected by the problem will be retested.

c. **Routine Deficiency** - A repeatable minor problem does not significantly impact site operations.

ACTION: The test continues with the current system; approved workarounds may be implemented. Routine deficiencies are submitted by the TRG to the Project Manager for adjudication.

d. **Watch Item** - A random or one-time, non-repeatable problem with potentially significant impact on site operations.

ACTION: The TRG monitors test activities for recurrence of the problem; if recurrence is documented, the TRG considers re-categorizing the problem.

e. **Potential Enhancement** - Identifies a new requirement.

ACTION: The TRG forwards the potential enhancement to the Project Manager for adjudication. The Project Manager may then forward the potential enhancement as a Request for Change.

5.5 System Operation

The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements will be operated 24 hours a day, 7 days a week during the OAT.

5.6 System Support

The operational support and maintenance concept for the Linux hardware components will differ in some important ways from their existing Hewlett Packard Unix (HP-UX) and HP-RT counterparts.

If maintenance is required, site personnel must contact the AWIPS NCF. AWIPS problem resolution and maintenance are centralized at the NCF. The NCF will have monitor and control responsibility for the AWIPS Linux DX/NAS and gig-e switch. When a fault or problem is discovered by NCF personnel or is phoned into the NCF Help Desk, the problem will be diagnosed by the NCF operators and resolution coordinated with the NWS site representative, if necessary. Often, the NCF can discover problems and correct them without requiring coordination with the site. The NCF will generate a trouble ticket to document and track each problem.

The Linux DX/NAS, gig-e switch, and serial MUX replacement hardware components are covered by a maintenance contract with the vendor, Dell Computer Corporation. The NLSC will stock a few spare systems to quickly resolve any hardware problems encountered. **All problems with the Linux DX/NAS, gig-e switch, and serial MUX replacement must be called into the NCF for tracking of the trouble and resolution of the problems**. If the problem is found to be software related, the problem will be forwarded to the appropriate personnel for resolution. If the problem is hardware related, the site the site will order a replacement DX/NAS, gig-e switch, and serial MUX replacement through the Consolidated Logistics System (CLS), and install the new DX/NAS, gig-e switch, and serial MUX replacement once it arrives. The site will pack up the defective DX/NAS, gig-e switch, and serial MUX replacement and ship it to the National Reconditioning Center (NRC) for repair. All hardware troubleshooting will take place at the NRC. The NRC will also coordinate with Dell to come on site and repair the DX/NAS, gig-e

switch, and serial MUX replacements. The site will enter the appropriate maintenance data into the Engineering Management Reporting System (EMRS, see Attachment 4).

During the OAT, the NLSC functions will be handled by NGIT through the NCF. During the OAT, the NGIT will hold the spare DX/NAS, gig-e switch, and serial MUX replacements and will perform the NRC function. If a spare DX/NAS, gig-e switch, and serial MUX replacement is needed during the OAT, the sites will ask the NCF to arrange for a spare to be shipped to the site. After the OAT the NRC will perform this function and the sites will contact them if necessary.

6.0 OAT Management

These sections describe the roles and responsibilities of the NWS in the oversight and management of the OAT. The NWS OOS TEB has overall responsibility for coordinating the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement OAT. The OST Systems Engineering Center (SEC) has overall project management responsibility for the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement project.

6.1 National Weather Service Headquarters

OAT Director - (OOS TEB, Mary Buckingham, 301-713-0326 x137) Organizes and manages the NWS personnel supporting the OAT. Documents and coordinates for signature the NWS involvement in the OAT in a formal OAT Plan. Coordinates conference calls and manages the day-to-day OAT data collection, including PAMS, collecting the data and creating the required reports. Documents the results in the OAT Report and provides briefings as required. Participates as an on-site test team member.

AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement Project Manager - (OST SEC, Tim Hopkins, 301-713-1570 x129) Reviews the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement OAT Plan and Report. Participates in the OAT as a AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement technical resource. The OST SEC has overall engineering responsibility for the Linux DX/NAS, gig-e switch, and serial MUX replacement port project. This includes the development of the target hardware architecture for the DX/NAS, gig-e switch, and serial MUX replacement, by the Architecture and Analysis Branch and any required changes to the AWIPS software by the SEC Development Branch. The Development Branch will also integrate and test the software loads for the DX/NAS, gig-e switch, and serial MUX replacement and produce any CDs required for Linux-based deployment. The Development Branch will also have overall responsibility to manage software development activities required for these deployments.

Maintenance Branch AWIPS Computer Specialist - (OOS, Maintenance Branch, Jagdish Sharma, 301-713-1833 x128) Responsible for the AWIPS System Modification Note and coordinates maintenance issues. Supports the OAT in all maintenance related activities. Focal point for the modification and maintenance note coordination, documentation publications, and logistics and maintenance. Reviews the AWIPS XT Replacement OAT Plan and Report.

Maintenance Branch AWIPS Engineering Support - (OOS, Maintenance Branch, Karthik Srinivasan, 301-713-1892 x158) Provides support for the modification and maintenance note coordination, documentation publications, and logistics and maintenance focal point.

OAT Team - Supports the OAT director in coordinating and managing the OAT activities. Contributes to the analysis of the test data and writing and review of plans, reports, and conference call minutes and provides input to the OAT director. The members include personnel from OST, and OOS (see Attachment 6, Table A6-1).

AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement Support - (NCF Focal Point: Karl Baetcke (301) 713-9362 x322) The NCF will provide support to field site users if problems develop. ***Operators must report all AWIPS Linux DX/NAS, gig-e problems to the NCF at 301-713- 9344.*** The Site Support Team (SST) will provide assistance to the OAT sites in resolving software problems with the Linux DX/NAS, gig-e switch, and serial MUX replacement and may send a representative to witness the first site installed.

6.2 Test Review Group

The Test Review Group (TRG) is comprised of a group of subject-matter experts and is chaired by the director of the OAT. The role of the TRG is to evaluate the impact of each trouble report on daily field service operations and make recommendations to the AWIPS XT Replacement project manager on their criticality. The TRG is comprised of the personnel from the offices identified in Table 1. Following completion of the OAT, the TRG will convene to review the findings and recommend whether to proceed with national implementation.

Table 1. OAT Test Review Group (TRG)

Name/Organization		Function		Phone
Mary Buckingham	OPS24	Test Review Group Chair	[Voting Member]	301-713-0326 x137
Tim Hopkins	OST31	Project Manager	[Voting Member]	301-713-1570 x129
Joel Williams	OST23	Implementation Manager	[Voting Member]	301-713-3400 x114
Karl Baetke	AWIPS NCF	NCF Focal Point		301-713-9344
Jagdish Sharma	OPS12	Maintenance Assurance		301-713-1833 x163
Karthik Srinivasan	OPS12	Maintenance Branch AWIPS Engineer		301-713-1892 x158
Bill Gery	CR41x2	CRH AWIPS Program Manager	[Voting Member]	816-891-7734 x414
Neil Dipasquale	ERx2	ERH AWIPS Program Manager	[Voting Member]	631-244-0104
Eric Howieson	SR41x2	SRH AWIPS Program Manager	[Voting Member]	817-978-7777 x132
Jeff Walker	WR41	WRH AWIPS Program Manager	[Voting Member]	801-524-5120 x 278
Philip Mieczynski	AR41x3	ARH AWIPS Program Manager	[Voting Member]	907-271-4421
Bill Ward	PR11	PRH AWIPS Program Manager	[Voting Member]	808-532-6430

6.2 NWS Regional Headquarters/NCEP

The Regional Headquarters will participate in the development and review of the OAT Plan and will monitor developments at their respective sites during the OAT. Specifically, the Regional AWIPS Focal Points or designees will:

a. Review and coordinate the proposed OAT sites to comment on their availability and suitability.

b. Coordinate requirements for site preparation, equipment installation, operations and reporting with other members of the OAT site management team.

c. Identify NWS points of contact for each OAT site.

d. Participate in OAT conference calls.

e. Southern Region Headquarters (SRH) will participate as OAT sites. As such, they will designate regional personnel as focal points.

6.3 NWS OAT Sites

The OAT sites will:

a. Identify an AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement focal point (see Table A6-2) to coordinate the system installation and complete the Installation Evaluation in Attachment 2.

b. Install and configure the new Linux DX/NAS, gig-e switch, and serial MUX replacements using the most recent revision of the AWIPS System Modification Note after the OAT director informs the site to begin.

c. Use the AWIPS Linux DX/NAS and gig-e switch in operations during the OAT, documenting problems or difficulties to operations arising from the DX/NAS, gig-e switch, and serial MUX replacements' use.

d. Perform the failure simulation procedures to test the failover capabilities of the Linux DX/NAS and gig-e switch(see Attachment 3)

e. Participate in conference calls to provide information on the DX/NAS, gig-e switch, and serial MUX replacement installation and operations.

f. Document all maintenance activity associated with this OAT plan using the EMRS Data Entry System. Follow the specific guidance for maintenance activity documentation provided in the AWIPS System Modification Note 24 (see Attachment 4).

PART II: OAT Methodology

1.0 Introduction and Approach

The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement OAT evaluates the new system for 90 days at ten field sites, one regional headquarter, and one NCEP. The site personnel will install the hardware and software. The installations will be monitored to allow revision on the AWIPS System Modification Note as needed. The conclusions, along with information from the NCF, will support the recommendations for the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement full deployment decision briefings.

2.0 OAT Sites

The twelve test sites were chosen to represent the characteristics of each region, the types of AWIPS sites, and are approximately 8% of all AWIPS sites to form a valid statistical sample. Table 2 lists the sites participating in this OAT and their site identification (SID) code. Each OAT site will designate a Focal Point to communicate with the OAT Team from the WSH and to be responsible for the conduct of the OAT at the site. A complete listing of the sites' addresses, telephone numbers, and focal points are given in Attachment 6, Table A6-2, OAT Site Contacts.

Table 2. OAT Sites

Region/NCEP		Office	SID
Central	1	WFO Pleasant Hill, MO	EAX
	2	WFO Bismarck, ND	BIS
Eastern	3	WFO Sterling, VA	LWX
	4	WFO Burlington, VT	BTV
Southern	5	Southern Region Headquarters, Fort Worth, TX	EHU
	6	WFO Jackson, MS	JAN
	7	WFO Midland/Odessa, TX	MAF
Western	8	NWRFC Portland, OR	PTR
	9	WFO Salt Lake City, UT	SLC
Alaska	10	WFO Anchorage, AK	AFC
Pacific	11	WFO Honolulu, HI	HFO
National Center	12	Aviation Weather Center	NAW

3.0 OAT Methodology

The Linux DX/NAS, gig-e switch, and serial MUX replacement evaluation will focus primarily on two aspects:

1. The installation of the new Linux DX/NAS, gig-e switch, and serial MUX replacement, and
2. The performance of the Linux DX/NAS, and gig-e switch.

The OAT will also ensure the upgrade does not affect other aspects of the AWIPS system. Because the Linux DX/NAS, gig-e switch, and serial MUX replacement adds new hardware and software in the critical AWIPS data stream, the installation must be done smoothly and quickly at each AWIPS site to prevent a large loss of data and adverse impact on site operations.

The installation is estimated to take two days to complete. Day 1 is the hardware installation including laying cables. Almost all of this activity will not affect site operations. There is a brief interruption to the LAN while the NCF reboots the switches after they are configured. This would only be noticeable if a forecaster tried to access something across the LAN during this time. The mod note instructs to clear the action with the forecasters first - no more than 10 minutes. There will be another brief interruption to the PXs when they are failed over to the other one for the serial MUX upgrade. No data will be lost as it gets queued on the CP and the remaining PX will continue to operate. There should be no interruption to site operations from this.

Day 2 runs the scripts that copy all the data to the NAS and activates the systems. This is expected to take about 4 hours for a normal WFO and longer for sites having more users, workstations, and more data. The system is effectively shut down during this time. The DS and PXs are shut down and there is no ingest from the SBN, although the CPs will continue to queue the incoming data. **Sites may wish to go into service backup during this period.** The serial MUX is installed but is not activated during this installation. AWIPS software release OB5 is expected to activate the serial MUX.

3.1 Success Criteria

The success or failure of the OAT will be based on the acceptability of the installation instructions and kits to the OAT site ESAs, and analyses of data collected during the OAT. Deficiencies in the installation will be addressed by revision of the instructions as needed and changes to the FMKs during the deployment of the DX/NAS, gig-e switch, and serial MUX replacements. The following criteria must be met:

Timeliness

No degradation of the current average of the timeliness of products processed through the decoders on the new DX/NAS, gig-e switch, and serial MUX replacements.

Reliability

No degradation of the current average of the reliability of products processed through the decoders on the new DX/NAS, gig-e switch, and serial MUX replacements.

Data Retrieval

No degradation or restriction on retrieval of products from the NAS.

3.2 OAT Documentation

The documentation required for the OAT includes:

1. Installation Evaluation (See Attachment 2); to be completed by the person(s) who performed the installation and checkout. The site personnel are requested to provide comments about the questions on both their positive and negative experiences. Suggestions for improvement are encouraged. The completed evaluation questionnaire can be faxed to 301-713-0912 or the answers emailed to Mary.Buckingham@noaa.gov.

2. Document any problems encountered or impacts on site operations, and improvement suggestions. Site logs or email may be used (fax paper to 301-713-0912; send emails to Mary.Buckingham@noaa.gov.

3. EMRS reporting (see Attachment 4)

3.3 System Installation

The OAT sites will receive the LINUX DX/NAS, gig-e switch, and serial MUX replacement FMK from NGIT prior to commencement of the OAT (see Part I, Section 5.2, item c). The OAT sites may open the boxes to ensure all expected components arrived, but **must not install the system until the OAT director authorizes them to start**.

The new DX/NAS will arrive by truck pre-installed in a new rack (24"x38" deep). Sites must determine where the new rack will be sited in the equipment room and have it placed there when it arrives. Adequate power must be available for the new rack and a standard AWIPS access hole must be installed beneath it in the raised floor.

To reduce the risk of incorrect installations and excessive impact on site operations, the OAT will control the installations and assess the Modification Note for each type of AWIPS site. After each type of installation, the Modification Note will be revised incorporating the information gained from the previous installation. If necessary, additional Modification Notes will be drafted to address the installation for specific types of system. The AWIPS Maintenance Branch will make the decision to draft additional Modification Notes. Sites will use the latest revision of the Modification Note for their installation once the OAT director instructs them they may install. Because the installation inserts a critical element into the AWIPS system, the installation must be carefully evaluated. Each type of site will be installed with the assistance of the test team to ensure the installation instructions are correctly noted in the Modification Note.

The OAT will divide the testing into 5 kinds of sites and a test team will be on site for each type:

1. Regional Headquarters
2. CONUS WFOs
3. OCONUS WFOs
4. RFC
5. NCEP

Because the WFO sites have the most stress on operations due to poor DS performance, the OAT will concentrate first on the WFO installations. There is a mandate from the NWS Corporate Board to deploy to a subset of poor performing WFOs before severe weather season begins in 2005 to attempt to address problems at poorly performing systems in the 2004 severe weather season. Therefore, the OAT will attempt to evaluate the WFO systems and their performance first before evaluating the RFC and NCEP systems.

The evaluation will begin with the regional headquarter's non-operational site installing the new DX/NAS, gig-e switch, and serial MUX replacements with the draft AWIPS System Modification Notes for guidance to reduce risk to operational sites. WSH OAT Team support will be on site to evaluate the mod note. All problems with the installation procedures will be corrected before the first operational site is installed. After the installation evaluation at the first WFO and when the mod note is ready, the remaining WFO sites will begin their installations. Conference calls will be used to coordinate the installations and discuss the problems encountered. The Outside the Continental United States (OCONUS) WFOs will be the next sites evaluated while the CONUS WFOs begin their installations at the rate of no more than 2 per week.

Following the OCONUS on-site evaluation, the RFC will be evaluated then the National Center site. (See Section 5.0 for the tentative detailed schedule)

The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements will be delivered to the OAT sites with pre-installed operating systems and device drivers. The installations will be performed by site personnel following the most recent mod note. Each of the sites designated to have the on-site test team present will begin installation when the test team arrives to observe the installation. The sites will notify the NCF the installation is beginning, install the Linux DX/NAS, gig-e switch, and serial MUX replacements and associated switches, install the provided software from the CD, and configure the two new Linux DX/NAS, gig-e switch, and serial MUX replacements. When the installation is complete, the site should notify the NCF to resume normal site monitoring. Sites must ensure their local application software is coreclty repointed to the databases moved to the NAS.

A conference call with the first site will evaluate the installation and provide an opportunity for the remainder of the test sites to learn what is involved and ask questions. All the OAT sites and regional focal points will be invited to participate in the conference calls. Immediately after successfully completing the installation, the site personnel will complete the Installation Evaluation. Once the observed installations are finished and the Modification Note is revised using the information gained from those sites, the remainder of the test sites will be given the authorization to proceed with their installations following the latest revision of the Modification Note.

The OAT will be conducted by the WSH OAT team and the test site personnel with occasional conference calls and required contacts by telephone and electronic mail. The OAT methodology consists of the activities in Section 5, Table 3, OAT Activities and Schedule. A pre-OAT conference call will be held during the week prior to beginning the OAT with the OAT sites, WSH OAT team, and regional focal points. This conference will ensure the OAT is ready to begin, the sites understand what is expected of them and the team is ready to support the OAT.

3.4 Linux DX/NAS, gig-e switch, and serial MUX replacement Evaluation Methodology

The Linux DX/NAS, gig-e switch, and serial MUX replacement evaluation will consist of site actions and monitoring of the DX/NAS and gig-e switch performance. The new DX/NAS automatic failure recovery will be tested using the procedures in Attachment 3. The failure procedures may be performed in any order and multiple failures may be tried at once. The failure procedures will also evaluate whether the NCF can detect the failed system correctly. *Do not conduct the failure procedures until after the NCF is advised the installation is complete and they should resume normal site monitoring.*

Software will be provided in the FMK to perform this function but the NCF will run the procedure and ensure the system is returned to the non-DX/NAS, gig-e switch, and serial MUX replacement configuration correctly. In this situation, the hardware changes remain in place, but the software functions without use of the DX/NAS and gig-e switch. Notify the OAT director as soon as practicable if this action is taken.

3.4.1 Test Site Actions

The test sites should keep track of any system crashes or anomalies they might see during the evaluation and report them to the OAT director. The replacement of the DX/NAS, gig-e switch, and serial MUX replacement should not adversely affect other aspects of the AWIPS system, although it is hoped the forecasters will experience faster data retrieval and fewer system slowness problems.

To ensure seamless operations at the test sites, perform the procedures in Attachment 3 shortly after the installation to simulate the DX/NAS, gig-e switch, and serial MUX replacement failure scenarios. This will evaluate how well the Linux DX/NAS, gig-e switch, and serial MUX replacement backup performs in the event of a failure of the Linux DX/NAS, gig-e switch, and serial MUX replacement. Since the DX/NAS, gig-e switch, and serial MUX replacement consists of two "hot backup" computers, both a failure of PX1 and a failure of PX2 should be tested. In addition, because the DS and AS software and failure recovery software was changed, both of these servers must be tested, as well.

Complete the Installation Evaluation in Attachment 2 and return to WSH (Section 3.1, item 1).

3.4.2 Performance Evaluation

Test Procedures:

1. Prior to the installation, performance measuring tools will be used at each of the test sites to measure the current system performance of the DS. After the installations are complete, the performance measurements will be repeated to determine whether any improvement can be seen with the data running on the NAS and over the gig-e switch.

2. Service backup will be tested in two modes to ensure there are no problems with it.
   a. Backup by the OAT site with the DX system installed for a site without the DX, and
   b. Backup by a non DX site for the DX OAT site.

3. Ensure all applications are able to perform correctly with the data stored on the NAS. Sites must ensure their local applications are mounted correctly after the installation since the installation scripts might not be able to move all non-baseline mounts correctly.

4. DX failure and recovery procedures to ensure the automatic failover performs correctly.

The serial MUX replacement will be installed with this equipment upgrade but will not be functional at this time and therefore will not be tested for functionality. A later software upgrade will enable the use of the serial MUX replacement .

3.5 Maintenance Data Collection

The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement equipment has a three-year warranty and will be serviced by Dell Computer Corporation. The OAT does not have a sufficient length of time or track enough sites to provide a statistically valid maintenance analysis, but the problems noted and system outages will be reported as indicators of the stability of the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement. **All problems must be called to the NCF for tracking purposes and to ensure they are entered into the discrepancy report data base when appropriate.** The NCF will be asked to provide copies of the trouble tickets opened on the Linux DX/NAS, gig-e switch, and serial MUX replacements during the OAT to the test team for evaluation.

EMRS will collect maintenance data on the new Linux DX/NAS, gig-e switch, and serial MUX replacement equipment. The NWS electronics staff must document all maintenance activity on the Linux DX/NAS, gig-e switch, and serial MUX replacements in accordance with the instructions outlined in Attachment 4 and in the Engineering Handbook No. 4 (EHB-4).

4.0 OAT Materials

The following equipment and materials are required for the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement OAT:

a. AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement hardware and software FMK - The required equipment as described in Section 4.1 - Part I, System Description and Configuration.

b. AWIPS System Modification Note 24 - Used to install and configure the Linux DX/NAS, gig-e switch, and serial MUX replacements.

c. Linux Data Server Replacement, Serial MUX Replacement, Gigabyte Switch Upgrade OAT Plan - Used to ensure the uniform conduct and completion of the OAT and as a source of contact points for coordination.

d. AWIPS Linux DX/NAS, Gig-e Switch, and Serial MUX Replacement Installation Evaluation - Used to gather input from the site personnel about how difficult and time-consuming the DX/NAS, gig-e switch, and serial MUX replacement installation was (see Attachment 2).

5.0 OAT Schedule

The OAT schedule includes 90 days of AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement installation and use. Table 3 lists the tentative dates of the major OAT milestones. The installation schedule may change depending on the problems encountered and the time needed to correct the Modification Note. Initial emphasis is on the WFO systems to address the requirement to alleiviate stress on those systems unable to handle the severe weather season in 2004 before the 2005 severe weather season commences. The other site types will be tested after the WFO issues are resolved. The dates are tentative. The DX/NAS is the highest priority and an attempt is being made to speed it up so unforseen problems might require delays. Date changes will be made by e-mail.

Table 3. OAT Activities and Schedule

	Preparation	**Timeframe**	**Scheduled Date**
1.	OAT orientation conference call	Week -1	October 28
2.	Practice installation and correct Mod. Note on NMTR systems at WSH. Run failover and performance measurement procedures.	Week -2	October 18
3.	Ship equipment to OAT sites	Prior Month	October 15-November 15
Installation and Evaluation		Weeks 1-10	
4.	First regional headquarter site installs AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements and completes Installation Evaluation. Ensure PAMS Linux DX/NAS, gig-e switch, and serial MUX replacement scripts are operating. Run failover procedures. WSH test team on site. SRH (EHU)	Week 1	October 26-28
5.	Conference call to discuss the installations.	Week 1	October 28
6.	LWX installs AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements and complete Installation Evaluation. Run performance, failover, and service backup procedures. WSH test team on site. Revise mod note.	Week 3	November 2-4
7.	Conference call to discuss the installations. **Decision** on readiness to proceed with remainder of WFOs or test at additional operational site.	Week 3	November 4
8.	Remainder of CONUS WFOs install (limit 2 per week) and complete Installation Evaluation. Run performance, failover, and service backup procedures. Revise mod note as needed.	Week 5-8	November 15-December 17
9.	AFC installs AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements and completes Installation Evaluation. Run performance, failover, and service backup procedures. WSH test team on site. Revise mod note.	Week 4	November 8-11
10.	HFO installs AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacements and completes Installation Evaluation. Run performance, failover, and service backup procedures. WSH test team on site. Revise mod note.	Week 5	November 15-18

11.	Conference call to discuss the installations.	Week 5	November 18
12.	Conference call to discuss the installations.	Week 6	December 2
13.	PTR site installation. Complete Installation Evaluation. Run performance, failover, and service backup procedures. WSH test team on site. Revise mod note.	Week 11	January 11-13
14.	Conference call to discuss the installations.	Week 11	January 13
15.	NCEP site installation (NAW). Complete Installation Evaluation. Run performance, failover, and service backup procedures. WSH test team on site. Revise mod note.	Week 13	January 25-27
16.	Conference call to discuss the installation. Mod note revision.	Week 13	January 27
17.	Post installation conference call; discuss installations and any problems encountered and what could be improved.	Week 14	February 3
Operations		Weeks 10-15	
18.	Sites continue to operate with Linux DX/NAS, gig-e switch, and serial MUX replacements. Sites document problems by email. Conference calls held if needed.	Weeks 10-14	February 1 - 28
Data Analysis and Reporting		Weeks 15-26	
19.	WSH OAT Team test data and creates draft OAT Report	Weeks 15-19	March 1 -29

PART III: OAT Reporting

1.0 Introduction

This section describes the OAT data analysis and reporting.

2.0 Reports

If critical AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement problems occur, interim reports will be distributed immediately by e-mail to document the issues and the impacts on the field or on data distribution. The AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement OAT Report, containing OAT details, will be coordinated and distributed within 60 days after the end of the OAT.

3.0 Data Analyses

OOS TEB will perform analysis of the PAMS data collected during the OAT. The data will be analyzed to provide information about the Linux DX/NAS, gig-e switch, and serial MUX replacement to support a decision whether to proceed with deployment of the DX/NAS, gig-e switch, and serial MUX replacements in all sites and to identify problems and equipment outage periods. The analysis will be incorporated into the final OAT Report.

The NWS Configuration Management will collect and analyze the EMRS data collected. These data will be reported separately from the OAT Report.

4.0 Briefings

Briefings to NWS management will be provided as requested.

Attachment 1 - AWIPS Linux NAS Drive Allocation

This attachment presents the allocation of files on the new NAS.

NAS Drive Allocation

NAS1
10 x 72 GB Raw Disks (RAID 4)
Disks (10): Root/Data (7) + Parity (2) + Hot Spare (1)

Flexible Volume Name	Mount point	SNAP	Size (GB) WFO	Size (GB) RFC
/vol0	– None (NetApps O/S) –	*	5.0	5.0
/vol/awips_home	/home	*	10.0	10.0
/vol/data_fxa	/data/fxa		65.0	65.0
/vol/data_x400	/data/x400		0.6	0.6
/vol/awips_GFESuite	/awips/GFESuite		35.0 **	0
/vol/data_GFE	/data/GFE		0	0
/vol/awips_adapt	/awips/adapt	*	1.0	0
/vol/data_adapt	/data/adapt		2.5	0
/vol/awips_hydroapps	/awips/hydroapps		1.5	55.0
/vol/awips_gis	/awips/gis	*	3.0	3.0
/vol/awips_dev	/awips/dev	*	0.5	0.5
/vol/data_local	/data/local	*	9.0	9.0
/vol/DS_shared	/DS_shared		1.5	1.5
Total Space Used			**134.6**	**149.6**

Network Attached Storage

Note: * indicates that the flex volume includes snapshot backup coverage at 10%
** indicates that the size of the flex volume is increased to 50.0 GB for IFPS multiple domain sites (AFC, VRH, TBW4)

	WFO	RFC
Low level Format Capacity (GB per disk)	**66.0**	**66.0**
WAFL requirement of 10% (GB per disk)	**6.6**	**6.6**
Raw Root/Data Aggregate - Available Capacity (GB)	**415.8**	**415.8**

NAS Drive Allocation

		WFO (MB)	RFC (MB)	
1	/awips/dev	300	300	
2	/awips/hydroapps	402	18,000	54,701 RFC
3	/awips/adapt	870	0	
4	/data/fxa	5,300	5,300	58,944 TOTAL
5	/data/logs	805	806	*** Part of DS_shared
6	/data/x400	300	600	
7	/home	460	5,600	
8	/omni_shared	300	300	*** Part of DS_shared
9	/opt/gcc	280	280	*** Part of DS_shared
10	/data/fxa_local	1,200	1,200	* Part of /data/fxa
11	/data/local	9,000	990	
12	/data/adapt	2,500	0	
13	/awips/gis	0	3,000	
sdb1	/px1data	26,222	26,222	* Part of /data/fxa
sdb2	/awips/GFESuite	31,462	0	
sdc3	/px2data	26,222	26,222	* Part of /data/fxa
sdc5	/awips/hydro	0	36,701	** Part of /awips/hydroapps
		105,623	**126,521**	

Attachment 2 - AWIPS DX/NAS, Gig-e Switch, and Serial MUX Replacement Installation Evaluation

Test Site _____ **Modification Note Used**: #_____

1. What is your position title?

[ ] ESA
[ ] Electronic Technician
[ ] Lead Meteorologist
[ ] LINUX Focal Point
[ ] Other_____

2. Rate the Linux DX/NAS, gig-e switch, and serial MUX replacement hardware installation process:

[ ] 0 = no answer
[ ] 1 = very difficult
[ ] 2 = somewhat difficult
[ ] 3 = average
[ ] 4 = easy
[ ] 5 = very easy

Hardware installation process comments:

3. How long did the complete hardware installation (Linux DX/NAS, gig-e switch, and serial MUX replacement) take?

4. Rate the Linux DX/NAS, gig-e switch, and serial MUX replacement software installation, including localization, process:

[ ] 0 = no answer
[ ] 1 = very difficult
[ ] 2 = somewhat difficult
[ ] 3 = average
[ ] 4 = easy
[ ] 5 = very easy

Software installation process comments:

5. How long did the complete software installation take?

6. Were all the required Linux DX/NAS, gig-e switch, and serial MUX replacement components provided in a timely manner?

[ ] YES
[ ] NO; Comments:

7. Rate the utility of the AWIPS System Modification Note:

[ ] 0 = did not use
[ ] 1 = not useful
[ ] 2 = lacking needed information
[ ] 3 = adequate
[ ] 4 = useful
[ ] 5 = very useful

Comments:

8. Rate the ease of use of the AWIPS System Modification Notes:

[ ] 0 = no answer
[ ] 1 = very difficult
[ ] 2 = somewhat difficult
[ ] 3 = average
[ ] 4 = easy
[ ] 5 = very easy

Comments:

9. Was assistance from outside the office required during the installation?

[ ] NO
[ ] YES, **please list the outside contacts you made** (e.g., office or person contacted from WSH, NCF, SST, Dell, other)**, and describe the problem with which you needed help and the solution given.**

10. How can the installation process be improved for full deployment?

11. Other comments about the installation of the AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement.

Email answers to completed questionnaire to mary.buckingham@noaa.gov or fax to 301-713-0912

Attachment 3 - Test Procedures

Table A3-1. Failure Recovery Procedures		
Server Failed	**Failover Successful? (Y/N)**	**Time to recover**
DX1 (failover to DX2)		
DX2 (failover to DX1)		
DS1 (failover to DS2)		
PX1 (failover to PX2)		
PX2 (failover to PX1)		
Service Backup OAT site failure		
Service Backup OAT site backup of non-DX site		

The procedures can be run in any order and multiple failures can be induced at once.

A3.1 PX Failure Recovery Procedure: PX1 Failure

PX1 to PX2 Failover

CONDUCTED BY: _____ DATE/TIME: _____ ITERATION: _____

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
PX1 to PX2 failover test. Simulate a PX1 failure. ***Note: The installation must be completed and the NCF notified to resume site monitoring before beginning this procedure.***				
2	From a Unix window on px2-<site> as root enter: **hb_stat** Repeat from a Unix window on px1-<site>.	The status of the PXs is displayed. Ensure both PXs are up, px1apps is owned by px1-<site> and px2apps is owned by px2-<site>.		
3	From a Unix window on px2-<site> as root enter: **cd /var/logs** **tail -f cluster**	The cluster.log is opened and pending.		
4	From another Unix window on px2-<site> as root enter: **cd /data/logs** **tail -f start.ingest.px1.log**	The start.ingest.px1.log is opened and pending.		
5	Pull the LAN cable from the rear of the PX1 box to remove it from the LAN. (Port Gb1) — or — On px1 as root, shutdown px1: **shutdown -h now** After completion of the shutdown process, power off px1.	Red banner message appear on all workstations indicating preprocessor swap in progress. When the failover is successful, activity is displayed in the tail of the px1apps.log and the start.ingest.px1.log. Note: The processes for failover for a LAN failure is different from a failure in the PX server. Both scenarios should be tested.		

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
6	The failover process takes less than 5 (five) minutes.		Failover time _____	
7	The NCF detects the failover, and notifies the site. Continue with the test while waiting for NCF notification.	The NCF notifies the site of the failover.	NCF's response time: _____	
8	Upon completion of the failover, enter: **hb_stat**	Verification the *px1apps* is now owned by px2-<site>. Verify the px1-<site> node is down.		
9	Enter: **ps -ef | grep fxa**	The fxa processes are listed.		
10	Use **Process List: Single Server** table to verify all system processes that normally run on px1 are now running on px2.	All system processes are on px2.		
11	Maintain this failover configuration for a few minutes. Assess the system's performance while running solely on the px2.	No system instability or other problems while running on px2.		
Restore System to Normal Configuration				
12	Return the PX1 LAN cable back into the LAN (Port Gb1) or if a shutdown was performed, reboot PX1.	PX1 is reconnected to the LAN.		
13	Request the NCF to swap back to the dual PX configuration. Perform any restoration procedures needed for site-unique systems.	The NCF configures px1 back into the cluster. (See Section 5 in the AWIPS Linux Preprocessor Prototype Technical Notes for the commands to restore the system.)		
14	Note the time the NCF took to perform the failover process.		Failover time _____	

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
15	On px1-<site> enter: **hu_stat**	The *px1apps* is now owned by px1-<site>.		
16	On px1 enter: **ps -ef | grep fxa**	The fxa processes are listed.		
17	Use **Process List: px1apps** table to ensure all processes for px1 are displayed.	Verification all fxa processes successfully moved over to px1-<site>.		
18	Use the crontab table and verify the crontabs are running.			
19	End of test			

Witnessed: _____ Overall Outcome: [ ] Pass [ ] Suspend Date: _____

Process List: px1apps	
Process Name	**Number of Processes**
acqserver	4
CommsRouter	2
DataController	3
GribDecoder	1
SatDecoder	1
GribImgDecoder	1

Process List: px2apps	
Process Name	**Number of Processes**
acqserver	2
CommsRouter	1
DataController	1
BufrDriver	1

Process List: Single Server	
Process Name	**Number of Processes**
acqserver	5
CommsRouter	2
DataController	4
GribDecoder	1
SatDecoder	1
GribImgDecoder	1
BufrDriver	1

A3.2 PX Failure Recovery Procedure: PX2 Failure

PX2 to PX1 Failover

CONDUCTED BY: _____ **DATE/TIME:** _____ **ITERATION:** _____

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
PX1 to PX2 failover test. Simulate a PX2 failure. ***Note: The installation must be completed and the NCF notified to resume site monitoring before beginning this procedure.***				
1	From a Unix window on px1-<site> as root enter: **hb_stat** Repeat from a Unix window on px2-<site>.	The status of the PXs is displayed. Ensure both PXs are up, px1apps is owned by px1-<site> and px2apps is owned by px2-<site>.		
2	From a Unix window on px1-<site> as root enter: **cd /var/logs** **tail -f cluster.log**	The cluster.log is opened and pending.		
3	From another Unix window on px2-<site> as root enter: **cd /data/logs** **tail -f start.ingest.px2.log**	The start.ingest.px2.log is opened and pending.		
4	Pull the LAN cable from the rear of the PX2 box to remove it from the LAN. (Port Gb1) — or — On px2 as root, shutdown px2: **shutdown -h now** After completion of the shutdown process, power off px2.	Red banner message appear on all workstations indicating preprocessor swap in progress. When the failover is successful, activity is displayed in the tail of the px2apps.log. Note: The processes for failover for a LAN failure is different from a failure in the px server. Both scenarios should be tested.		

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
5	The failover process takes less than 5 (five) minutes.		Failover time _____	
6	The NCF detects the failover, and notifies the site. Continue with the test while waiting for NCF notification.	The NCF notifies the site of the failover.	NCF's response time: _____	
7	Upon completion of the failover, enter: **hb_stat**	Verification the *px2apps* is now owned by px1-<site>. Verify the px2-<site> node is down.		
8	Enter: **ps -ef | grep fxa**	The fxa processes are listed.		
9	Use **Process List: Single Server** table to verify all system processes that normally run on px2 are now running on px1.	All system processes are on px1.		
10	Maintain this failover configuration for a few minutes. Assess the system's performance while running solely on the px1.	No system instability or other problems while running on px1.		
Restore System to Normal Configuration:				
11	Return the LAN cable PX1 back into the LAN (Port Gb1) or if a shutdown was performed, reboot PX1.	PX1 is reconnected to the LAN.		
12	Request the NCF to swap back to the dual PX configuration. Perform any restoration procedures needed for site-unique systems.	The NCF configures px2 back into the cluster. (See Section 5 in the AWIPS Linux Preprocessor Prototype Technical Notes for the commands to restore the system.)		
13	Note the time the NCF took to perform the failover process.		Failover time _____	

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
14	On px1-<site> enter: **hb_stat**	The *px2apps* is now owned by px2-<site>.		
15	On px1 enter: **ps -ef | grep fxa**	The fxa processes are listed.		
16	Use **Process List: px2apps** table to ensure all processes for PX2 are displayed.	Verification all fxa processes successfully moved over to px2-<site>.		
17	Use the crontab table and verify the crontabs are running.			
18	End of test			

Witnessed: _____ Overall Outcome: [ ] Pass [ ] Suspend Date: _____

Process List: px1apps	
Process Name	**Number of Processes**
acqserver	4
CommsRouter	2
DataController	3
GribDecoder	1
SatDecoder	1
GribImgDecoder	1

Process List: px2apps	
Process Name	**Number of Processes**
acqserver	2
CommsRouter	1
DataController	1
BufrDriver	1

Process List: Single Server	
Process Name	**Number of Processes**
acqserver	5
CommsRouter	2
DataController	4
GribDecoder	1
SatDecoder	1
GribImgDecoder	1
BufrDriver	1

A3.3 DX Failure Recovery Procedure: DX1 Failure

DX1 to DX2 Failover

CONDUCTED BY: _____ **DATE/TIME:** _____ **ITERATION:** _____

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
DX1 to DX2 failover test. Simulate a DX1 failure. ***Note: The installation must be completed and the NCF notified to resume site monitoring before beginning this procedure.***				
18	From a Unix window on DX2-<site> as root enter: **hb_stat** Repeat from a Unix window on DX1-<site>.	The status of the DXs is displayed. Ensure both DXs are up, DX1apps is owned by DX1-<site> and DX2apps is owned by DX2-<site>.		
19	From a Unix window on DX2-<site> as root enter: **cd /var/logs** **tail -f cluster.log**	The cluster.log is opened and pending.		
20	Pull the LAN cable from the rear of the DX1 box to remove it from the LAN. (Port Gb1) — or — On DX1 as root, shutdown DX1: **shutdown -h now** After completion of the shutdown process, power off DX1.	Red banner message appear on all workstations indicating preprocessor swap in progress. When the failover is successful, activity is displayed in the tail of the cluster.log. Note: The processes for failover for a LAN failure is different from a failure in the DX server. Both scenarios should be tested.		
21	The failover process takes less than 5 (five) minutes.		Failover time _____	

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
22	The NCF detects the failover, and notifies the site. Continue with the test while waiting for NCF notification.	The NCF notifies the site of the failover.	NCF's response time: _____	
23	Upon completion of the failover, enter: **hb_stat**	Verification the *DX1apps* is now owned by DX2-<site>. Verify the DX1-<site> node is down.		
24	Enter: **ps -ef | grep fxa**	The fxa processes are listed.		
Restore System to Normal Configuration				
25	Return the DX1 LAN cable back into the LAN (Port Gb1) or if a shutdown was performed, reboot DX1.	DX1 is reconnected to the LAN.		
26	Request the NCF to swap back to the dual DX configuration. Perform any restoration procedures needed for site-unique systems.	The NCF configures DX1 back into the cluster.		
27	Note the time the NCF took to perform the failover process.		Failover time _____	
28	On DX1-<site> enter: **hb_stat**	The *DX1apps* is now owned by DX1-<site>.		
29	End of test			

Witnessed: _____ Overall Outcome: [ ] Pass [ ] Suspend Date: _____

A3.4 DX Failure Recovery Procedure: DX2 Failure

DX2 to DX1 Failover

CONDUCTED BY: _____ **DATE/TIME:** _____ **ITERATION:** _____

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
DX1 to DX2 failover test. Simulate a DX2 failure. ***Note: The installation must be completed and the NCF notified to resume site monitoring before beginning this procedure.***				
1	From a Unix window on DX1-<site> as root enter: **hb_stat** Repeat from a Unix window on DX2-<site>.	The status of the DXs is displayed. Ensure both DXs are up, DX1apps is owned by DX1-<site> and DX2apps is owned by DX2-<site>.		
2	From a Unix window on DX1-<site> as root enter: **cd /var/logs** **tail -f cluster.log**	The cluster.log is opened and pending.		
3	Pull the LAN cable from the rear of the DX2 box to remove it from the LAN. (Port Gb1) — or — On DX2 as root, shutdown DX2: **shutdown -h now** After completion of the shutdown process, power off DX2.	Red banner message appear on all workstations indicating preprocessor swap in progress. When the failover is successful, activity is displayed in the tail of the cluster.log. Note: The processes for failover for a LAN failure is different from a failure in the DX server. Both scenarios should be tested.		
4	The failover process takes less than 5 (five) minutes.		Failover time _____	

Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
5	The NCF detects the failover, and notifies the site. Continue with the test while waiting for NCF notification.	The NCF notifies the site of the failover.	NCF's response time: _____	
6	Upon completion of the failover, enter: **hb_stat**	Verification the *DX2apps* is now owned by DX1-<site>. Verify the DX2-<site> node is down.		
7	Maintain this failover configuration for a few minutes. Assess the system's performance while running solely on the DX1.	No system instability or other problems while running on DX1.		
Restore System to Normal Configuration:				
8	Return the LAN cable DX1 back into the LAN (Port Gb1) or if a shutdown was performed, reboot DX1.	DX1 is reconnected to the LAN.		
9	Request the NCF to swap back to the dual DX configuration. Perform any restoration procedures needed for site-unique systems.	The NCF configures DX2 back into the cluster.		
10	Note the time the NCF took to perform the failover process.		Failover time _____	
11	On DX1-<site> enter: **hb_stat**	The *DX2apps* is now owned by DX2-<site>.		
12	End of test			

Witnessed: _____ Overall Outcome: [ ] Pass [ ] Suspend Date: _____

A3.5 Data Server Failure Recovery Procedure: DS1 Failure

DS1 to DS2 Failover

CONDUCTED BY: _____ DATE/TIME: _____ ITERATION: _____

Test State	Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
DS1 to DS2 failover test. Simulate a DS1 failure. Note, the longer the site remains running on DS2, the longer the recovery time will be when the NCF returns operations to the DS1. ***Note: The installation must be completed and the NCF notified to resume site monitoring before beginning this procedure.***					
	1	From a Unix window on ds2-<site> as root enter: **tail -f etc/cmcluster/dsswap /dsswap.control.log**	The ds2swap.control.log is opened and pending.		
	2	From a Unix window on ds1-<site> as root enter: **tail -f etc/cmcluster/dsswap /dsswap.control.log**	The ds1swap.control.log is opened and pending.		
	3	On DS1, enter: **onstat -g dri**	The following INFORMIX status will be displayed: INFORMIX - OnLine Version 7.30 -- On-Line--Up. Data Replication: Type State Paired Server Standard off <blank> Note: INFORMIX must be in the above state before proceeding with this test case.		

Test State	Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
	4	Disconnect ds1-<site> from the FDDI ring. Patch ds1 out of the FDDI ring by quickly removing DS1A and plugging DS1A into AS1A. Leave the AS1A plug dangling.	The dsswap pkg has been halted and will be moved to ds2-<site>. The progress of the failover is displayed in the tail of the dsswap.control.log in the UNIX window. Red banner message appear on all workstations indicating Data server swap is in progress		
	5	When complete, another message appears to indicate the completion of the failover. The failover process takes less than 10 (ten) minutes.	Red banner message Data server swap completed is displayed.	Failover time _____	
	6	The NCF detects the failover, and notifies the site. Continue with the test while waiting for NCF notification.	The NCF notified the site of the failover.	NCF's response time: _____	
	7	Upon completion of the failover, enter: **cmviewcl**	Verification that the dsswap package is now running on ds2-<site>.		
	8	Enter: **onstat -g dri**	The following INFORMIX status will be displayed: INFORMIX - OnLine Version 7.30 -- On-Line--Up. Data Replication: Type State Paired Server Standard off <blank> Note: INFORMIX must be in the above state before proceeding with this test case.		
	9	Enter: **ps -ef | grep fxa**	The fxa processes are listed.		

Test State	Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
	10	Use to verify all system processes that normally run on ds1 are now running on ds2.	All system processes are on ds2.		
	11	Enter: **ps -ef | grep x400**	The x400 Mta processes are listed.		
	12	Use Data Server Processes table to verify the x400 Mta processes that normally run on ds1-<site> are now running on ds2-<site>.	All the x400 Mta processes are now running on ds2-<site>.		
	13	Use Data Server Processes table to verify the crons that normally run on ds1-<site> are now running on ds2-<site>.	The ds1-<site> crons are now on ds2-<site>.		
	14	Note: the longer a site remains running on DS2, the longer it will take the NCF to write the data collected on DS2 to DS1 when restoring the system.	The site did not notice system instability or other problems while running on ds2.		
		Return to Normal Operations			
	15	Plug DS1 back into the FDDI ring by quickly removing AS1A and plugging it into DS1A. Return the dangling connector to AS1A.	ds1-<site> returns back to the cluster.		
	16	Request the NCF to swap back to the dual DS configuration.	The NCF configures ds1 and ds2.		
	17	When complete, another message appears to indicate the completion of the failover. The failover process takes a variable time depending on the length of time spent running on DS2.	Red banner message Data Server swap completed is displayed.	Failover time _____	
	18	On ds1-<site> enter: **cmviewcl**	The dsswap pkg is now listed on ds1-<site>.		
	19	On ds1 enter: **ps -ef | grep fxa**	The fxa processes are listed.		

Test State	Step No.	Test Step	Expected Results	Comments/ Observations	Pass Y/N
	20	Use Data Server Processes table to ensure all processes for ds1 are displayed.	Verification all fxa processes successfully moved over to ds1-<site>.		
	21	On ds1-<site> enter: **ps -ef |grep x400**	The x400 processes are listed.		
	22	Use Data Server Processes table to ensure that the x400 processes restarted on ds1-<site>.	Verification the x400 processes successfully moved back to ds1-<site>.		
	23	Use Data Server Processes table to ensure that the crons successfully restarted on ds1.	Verification the crons successfully moved back to ds1-<site>.		
	24	Use the crontab table and verify the crontabs are running.			
	25	End of Test			

Witnessed: _____ Overall Outcome: [ ] Pass [ ] Suspend Date: _____

Data Server Processes Table
Data Server Processes
DataController SatelliteController LdadController
wfoApi cs_config#*
acqserver 1800 x 3**
CommsRouterGRID_ROUTER COMMS_ROUTER LDAD_ROUTER
RadarServer
DialServer
MhsServer
TextDB_Server Read
TextDB_Server Write
ingProcMon.pl***

hmMonitorServer
MhsRequestServer
routerStorePlotFile
RMR_Server
caseArchiveServer
routerStoreNetcdf
routerLdadDecoder
wwaServer
routerShefEncoder
listener
pollForData.pl
WatchDogInternal
ldadServer
syncComms
shefdecode
ctrlCpu
ps -ef |grep oper: shefdecoder
x400 processes: x400rd -10 -s -f /awips/ops/data/mhs/x400rd.cfg x400rd -10 -s -f /awips/ops/data/mhs/x400rd.cfg /usr/x400mail/bin/x400mta -d /usr/x400mail <site id) x400sc -f/awips/ops/data/mhs/x400sc.cfg -p/tmp/x400sc.fifo -
crontab -l *for* fxa root lamp ifps oper informix ldad

* There will be a wfoApi cs_config for every NEXRAD line that is currently configured

** The number of acqserver can vary from 3 to 6
*** This process is not specific to this server; however, it must be present on all servers to monitor ingest processes.

Attachment 4 - EMRS Guidance for the AWIPS Linux DX/NAS, Gig-e Switch, and Serial MUX Replacement

Refer to the AWIPS System Modification Note 24 for EMRS guidance.

Attachment 5 - Contact Lists

Table A5-1. AWIPS Linux DX/NAS, gig-e switch, and serial MUX replacement OAT Team

Name	Responsibility	Org. Code	Email Address	Telephone	Fax
Mary Buckingham	OAT Director	OPS24	Mary.Buckingham@noaa.gov	(301) 713-0326 x137	(301) 713-0912
Tim Hopkins	Linux Project Manager	OST31	Tim.Hopkins@noaa.gov	(301) 713-1570 x129	N/A*
Jim Williams	Technical Expert	OST31	James.D.Williams@noaa.gov	(301) 713-1570	N/A
Joel Williams	Implementation	OST11	Joel.Williams@noaa.gov	301-713-3400 x114	N/A
Jagdish Sharma	Maintenance Branch AWIPS Computer Specialist	OPS12	Jagdish.Sharma@noaa.gov	301-713-1833 x128	(301) 713-0964
Karthik Srinivasan	Maintenance Branch AWIPS Engineering Support	OPS12	Karthik.Srinivasan@noaa.gov	301-713-1892 x158	N/A
John Merhi	EMRS	OPS13	John.Merhi@noaa.gov	(301) 713-1892 x200	N/A
Wayne Martin	Site Support Team	OPS21	Wayne.Martin@noaa.gov	301-713-1724 x166	N/A
Joseph Gofus	OH Focal Point	OH	Joseph.Gofus@noaa.gov	301-713-0640 x156	N/A
Jerald Dinges	Test & Evaluation Branch Chief	OPS24	Jerald.Dinges@noaa.gov	(301) 713-0326 x160	(301) 713-0912
Karl Baetcke	NCF Focal Point	NCF	Karl.Baetcke@noaa.gov	(301) 713-9362 x322	N/A

* N/A = Not applicable

Send problems to the following (after calling the NCF):

email to: Mary.Buckingham@noaa.gov

or fax paper to: **301-713-0912**

Table A5-2. OAT Site Contacts					
Region	**Office**	**Contact Points**			
Central	**WFO Bismarck, ND** **BIS**	MIC:	Jim Fors		x642
	2301 University Dr, Box 1016	SOO:	Viggo Jensen		x766
	Bismarck, ND 58502	ITO:	Dave Derung		x486
	316-942-4224	ESA:	Karl Venneberg		x372
	WFO Pleasant Hill, MO **EAX**	MIC:	Lynn Maximuk		x642
	1803 N. 7 Hwy	SOO:	Suzanne Fortin		
	Pleasant Hill, MO 64080	ITO:	Mark Mitchell		x677
	816-540-5151	ESA:	John Tatum		-5147 x372
Eastern	**WFO Sterling, VA** **LWX**	MIC:	James E Lee		x222
	44087 Weather Service Rd	SOO:	Steven Zubrick		x224
	Sterling, VA 20166	ITO:	Steven Listemaa		
	(703) 260-0107	ESA:	Joe Byerly (acting)	(609) 261-6602	x228
	WFO Burlington, VT **BTV**	MIC:	Robert Bell		x222
	1200 Airport Dr.	SOO:	Paul.Sisson		x224
	South Burlington VT 05403	ITO:	Chuck McGill		x251
	(802) 862-8711	ESA:	John Compo		x260
Southern	**Southern Region Headquarters** **(EHU)**	FP:	Eric Howieson		x132
	819 Taylor Street, Room 10A06	ESA:	Martin Garcia		
	Fort Worth, TX 76102				
	Tel: 817-978-7777				

Table A5-2. OAT Site Contacts					
Region	**Office**		**Contact Points**		
	WFO Midland/Odessa, TX	**MAF**	MIC:	Raymond Fagen	x222
	2500 Challenger Drive		SOO:	Jeffrey Cupo	x224
	Midland, TX 79706		ITO:	Greg Jackson	x131
	(432) 563-5006		ESA:	Wayne Patterson	x260
	WFO Jackson, MS	**JAN**	MIC:	Alan Gerard	x222
	234 Weather Service Dr		SOO:	Jeff Craven	x224
	Jackson MS 39208		ITO:	Greg Garrett	x235
	(601) 936-2189		ESA:	Michael Ryan	x260
Western	**WFO Salt Lake City**	**SLC**	MIC:	Larry Dunn	x222
	2242 W North Temple		SOO:	Mark Jackson	x224
	Salt Lake City, UT 84116		ITO:	Randy Weatherly	x235
	(801) 524-4378		ESA:	Greg Wallace	x260
	NWRFC, Portland, OR	**PTR**	HIC:	Harold Opitz	
	5241 NE 122nd Ave		DOH:	Don Laurine	
	Portland, OR 97230		ITO:	Mark Pattee	
	503-326-7401 (HIC)		ESA:	Bill Flieder	x260
	971-326-7291		ET FP:	Brian Alley	x263
	503-326-2340				
Pacific	**WFO Honolulu, HI**	**HFO**	MIC:	Jim Weyman	-72
	2525 Correa Rd., Suite 250		SOO:	Andy Nash	
	Honolulu, HI 96822		ITO:	Gloria Fletcher	-5287
	(808) 973-5287		ESA:	Bill Boone	-5267
	(808) 973-5267		AA:		
Alaska	**WFO Anchorage, AK**	**AFC**	MIC:	Bob Hopkins	-5120
	6930 Sand Lake Road		SOO:	Carven Scott	-5111
	Anchorage, Ak 99502		ITO:	Craig Seracy	-5126
	Tel: 907-266-5102 (admin)		ESA:	Paul Rumbo	-5128
	Tel: 907-266-5105 (Pub svc)		AA:	Debbie Brown	x2
	Tel: 907-266-5128				
NCEP	**Aviation Weather Center**	**NAW**	Dir:	Jack May	x201
	7220 NW 101st Terrace		ITO:	Larry Hinson	-7250
	Kansas City, MO 64153		ESA:	Bill Pettyplace	-7252
	(816) 584-7200		AA:	Claudia McMullin	